AMENDMENTS

In the Claims:

Please amend Claims 5, 10, 13, 19, 45-47, 51, 56, 71-73, 76 and 81, and please cancel Claims 75, and 82-86 without prejudice.

The currently pending and amended claims are below. Please amend the claims following wherein amendment is indicated in parenthesis, wherein the deleted matter is shown by strikethrough, and wherein the added matter is shown by underlining.

Claims 1-3 (Canceled)

4. (Previously presented) A method of producing neural cells from umbilical cord blood comprising:

(a) obtaining a sample of mononuclear cells from said umbilical cord blood, wherein said mononuclear cells comprise pluripotent stem or progenitor cells; and

(b) growing said mononuclear cells from step (a) in a culture medium containing an effective amount of a differentiation agent for a period sufficient to change the phenotype of said stem or progenitor cells to neural.

5. (Currently amended) The method according to claim 4, wherein said differentiation agent is selected from the group consisting of retinoic acid, fetal or mature neuronal cells, BDNF, GDNF, NGF, FGF, TGF, CNTF, BMP, LIF, GGF, TNF, IGF, CSF, KIT, interferon, triiodothyronine, throxine, erythropoietin ~~erthyopoietin~~, thrombopoietin, silencers, SHC, proteoglycans, glycoproteins, neural adhesion molecules, and mixtures thereof.

6. (Previously presented) The method according to claim 4, wherein said differentiation agent is a mixture of retinoic acid and NGF.

7. (Previously presented) The method according to claim 5, wherein said differentiation agent comprises fetal or mature neuronal cells selected from the group consisting of mesencephalic cells and striatal cells.

8. (Previously presented) A method of producing neural cells from umbilical cord blood comprising:

(a) obtaining a sample of mononuclear cells from said umbilical cord blood, wherein said mononuclear cells comprise pluripotent stem or progenitor cells;

(b) selecting for and isolating said pluripotent stem or progenitor cells within said sample of mononuclear cells; and

(c) growing said stem or progenitor cells from step (b) in a culture medium containing an effective amount of a differentiation agent for a period sufficient to change the phenotype of said stem or progenitor cells to neural.

9. (Previously presented) The method according to claim 8, wherein said selecting and isolating step (b) is carried out using a magnetic cell separator to separate out cells containing a CD marker.

10. (Currently amended) The method according to claim 8, wherein said differentiation agent is selected from the group consisting of retinoic acid, fetal or mature neuronal cells, BDNF, GDNF, NGF, FGF, TGF, CNTF, BMP, LIF, GGF, TNF, IGF, CSF, KIT, interferon, triiodothyronine, thyroxine, erythropoietin ~~erthyopoietin~~, thrombopoietin, silencers, SHC, proteoglycans, glycoproteins, neural adhesion molecules, and mixtures thereof.

11. (Previously presented) A method of producing neural cells from umbilical cord blood comprising:

(a) obtaining a sample of mononuclear cells from said umbilical cord blood, wherein said mononuclear cells comprise pluripotent stem or progenitor cells;

(b) growing said mononuclear cells from step (a) in a culture medium containing an effective amount of a differentiation agent for a period sufficient to change the phenotype of said pluripotent stem or progenitor cells within said sample of mononuclear cells to neural; and

(c) selecting for and isolating said neural cells from said pluripotent stem or progenitor cells within said sample of mononuclear cells by essentially eliminating from said sample mononuclear cells having a CD marker.

12. (Previously presented) The method according to claim 11, wherein said selecting and isolating step (c) is carried out using a magnetic cell separator to separate out cells containing a CD marker.

13. (Currently amended) The method according to claim 11, wherein said differentiation agent is selected from the group consisting of retinoic acid, fetal or mature neuronal cells, BDNF, GDNF, NGF, FGF, TGF, CNTF, BMP, LIF, GGF, TNF, IGF, CSF, KIT, interferon, triiodothyronine, thyroxine, erythropoietin ~~erthyopoietin~~, thrombopoietin, silencers, SHC, proteoglycans, glycoproteins, neural adhesion molecules, and mixtures thereof.

14. (Previously presented) The method according to claim 13, wherein said differentiation agent comprises fetal or mature neuronal cells selected from the group consisting of mesencephalic cells and striatal cells.

15. (Previously presented) A method of producing a sample of enriched neural cells from a sample of mononuclear cells obtained from umbilical cord blood comprising:

(a) subjecting the mononuclear cells to an amount of an anti-proliferative agent effective to eliminate essentially all proliferating cells from said mononuclear cell sample;

(b) exposing the remaining non-proliferating cells from step (a) to a mitogen to provide a population of differentiated cells and quiescent cells comprising a population of pluripotent stem or progenitor cells; and

(c) growing said population of said differentiated cells and quiescent cells from step (b) to selectively grow said quiescent cells to the essential exclusion of said differentiated cells.

16. (Previously presented) The method according to claim 15, comprising the further step of incubating a cell population obtained from step (c) to a differentiation agent effective to induce a neural phenotype in said pluripotent stem or progenitor cells.

17. (Previously presented) The method according to claim 15, wherein said anti-proliferative agent is Ara-C.

18. (Previously presented) The method according to claim 15, wherein said mitogen is selected from the group consisting of epidermal growth factor and pokeweed mitogen.

19. (Currently amended) The method according to claim 16, wherein said differentiation agent is selected from the group consisting of retinoic acid, fetal or mature neuronal cells, BDNF, GDNF, NGF, FGF, TGF, CNTF, BMP, LIF, GGF, TNF, IGF, CSF, KIT, interferon, triiodothyronine, thyroxine, erythropoietin ~~erthyopoietin~~, thrombopoietin, silencers, SHC, proteoglycans, glycoproteins, neural adhesion molecules, and mixtures thereof.
20. (Previously presented) The method according to claim 19, wherein said differentiation agent is a retinoic acid selected from the group consisting of 9-cis retinoic acid, all transretinoic acid, and a mixture thereof.

Claims 21-42 (Canceled)

43. (Previously presented) A composition comprising umbilical cord blood or a mononuclear cell fraction, thereof, in combination with an effective amount of at least one neural differentiation agent, wherein said umbilical cord blood or mononuclear cell fraction comprise pluripotent stem or progenitor cells, and wherein said amount of neural differentiation agent is effective to induce a neural phenotype in said pluripotent stem or progenitor cells.
44. (Previously presented) The composition according to claim 43, further comprising a cell medium to which said differentiation agent is added.
45. (Currently amended) The composition according to claim 43, wherein said differentiation agent is selected from the group consisting of retinoic acid, fetal or mature mesencephalic or striatal cells, brain derived neurotrophic factor (BDNF), glial derived neurotrophic factor (GDNF), ~~glial growth factor (GFF),~~ nerve growth factor (NGF), fibroblast growth factor (FGF), transforming growth factors (TGF), ciliary neurotrophic factor (CNTF), bone-morphogenetic proteins (BMP), leukemia inhibitory factor (LIF), glial growth factor (GGF), tumor necrosis factors (TNF), interferon, insulin-like growth factors (IGF), colony stimulating factors (CSF), KIT receptor stem cell factor (KIT-SCF), interferon, triiodothyronine, thyroxine, erythropoietin, thrombopoietin, glial-cell missing silencer factor, neuron restrictive silencer factor, SRC-homology-2-domain-containing transforming protein, proteoglycans, glycoproteins, neural adhesion molecules, and mixtures thereof.

46. (Currently amended) The composition according to claim 43, wherein said differentiation agent is selected from the group consisting of retinoic acid, fetal or mature mesencephalic or striatal cells, brain derived neurotrophic factor (BDNF), glial derived neurotrophic factor (GDNF), glial growth factor (GGF ~~GFF~~), nerve growth factor (NGF), and mixtures thereof.

47. (Currently amended) The composition according to claim 43, wherein said differentiation agent is selected from the group consisting of mixtures of retinoic acid, brain derived neurotrophic factor (BDNF), glial derived neurotrophic factor (GDNF), glial growth factor (GGF ~~GFF~~), and nerve growth factor (NGF).

48. (Previously presented) The composition according to claim 45, further comprising a cell medium to which said differentiation agent is added.

49. (Previously presented) The composition according to claim 43, wherein said differentiation agent is a mixture of retinoic acid and nerve growth factor.

50. (Previously presented) A method of producing a pharmaceutical composition comprising a sample of mononuclear cells being enriched with cells having a neural phenotype marker, said method comprising:

(a) obtaining a sample of mononuclear cells from umbilical cord blood, wherein said mononuclear cells comprise stem or progenitor cells; and

(b) growing said mononuclear cells from step (a) in a culture medium containing an effective amount of a differentiation agent for a period sufficient to change the phenotype of said stem or progenitor cells to neural; and

(c) combining said cells obtained from step (b) with a pharmaceutically acceptable carrier, additive or excipient.

51. (Currently amended) The method according to claim 50, wherein said differentiation agent is selected from the group consisting of retinoic acid, fetal or mature neuronal cells, BDNF, GDNF, NGF, FGF, TGF, CNTF, BMP, LIF, GGF, TNF, IGF, CSF, KIT, interferon, triiodothyronine, thyroxine, erythropoietin ~~erthyopoietin~~, thrombopoietin, silencers, SHC, proteoglycans, glycoproteins, neural adhesion molecules, and mixtures thereof.

52. (Previously presented) The method according to claim 50, wherein said differentiation agent is a mixture of retinoic acid and NGF.

53. (Previously presented) The method according to claim 51, wherein said neuronal cells are selected from the group consisting of mesencephalic cells and striatal cells.

54. (Previously presented) A method of producing a pharmaceutical composition comprising neural cells obtained from umbilical cord blood comprising:

(a) obtaining a sample of mononuclear cells from said umbilical cord blood, wherein said mononuclear cells comprise stem or progenitor cells;

(b) selecting for and isolating said pluripotent stem or progenitor cells within said sample of mononuclear cells;

(c) growing said stem or progenitor cells from step (b) in a culture medium containing an effective amount of a differentiation agent for a period sufficient to change the phenotype of said stem or progenitor cells to neural; and

(d) combining said cells obtained from step (c) with a pharmaceutically acceptable carrier, additive or excipient.

55. (Previously presented) The method according to claim 54, wherein said selecting and isolating step (b) is carried out using a magnetic cell separator to separate out cells containing a CD marker.

56. (Currently amended) The method according to claim 54, wherein said differentiation agent is selected from the group consisting of retinoic acid, fetal or mature neuronal cells, BDNF, GDNF, NGF, FGF, TGF, CNTF, BMP, LIF, GGF, TNF, IGF, CSF, KIT, interferon, triiodothyronine, thyroxine, erythropoietin ~~erthyopoietin~~, thrombopoietin, silencers, SHC, proteoglycans, glycoproteins, neural adhesion molecules, and mixtures thereof.

57. (Previously presented) A method of producing a pharmaceutical composition comprising neural cells obtained from umbilical cord blood comprising:

(a) obtaining a sample of mononuclear cells from said umbilical cord blood, wherein said mononuclear cells comprise pluripotent stem or progenitor cells;

(b) growing said mononuclear cells from step (a) in a culture medium containing an effective amount of a differentiation agent for a period sufficient to change the phenotype of said pluripotent stem or progenitor cells within said sample of mononuclear cells to neural;

(c) selecting for and isolating said cells having a neural phenotype from said pluripotent stem or progenitor cells within said sample by essentially eliminating from said sample mononuclear cells having a CD marker; and

(d) combining said cells having a neural phenotype isolated from step (c) with a pharmaceutically acceptable carrier, additive or excipient.

58. (Previously presented) The method according to claim 57, wherein said selecting and isolating step c is carried out using a magnetic cell separator to separate out cells containing a CD marker.

59. (Previously presented) The method according to claim 57, wherein said differentiation agent is selected from the group consisting of retinoic acid, fetal or mature neuronal cells, BDNF, GDNF, NGF, FGF, TGF, CNTF, BMP, LIF, GGF, TNF, IGF, CSF, KIT, interferon, triiodothyronine, thyroxine, erythropoietin, thrombopoietin, silencers, SHC, proteoglycans, glycoproteins, neural adhesion molecules, and mixtures thereof.

60. (Previously presented) The method according to claim 57, wherein said differentiation agent is a mixture of retinoic acid and nerve growth factor.

61. (Previously presented) The method according to claim 57, wherein said cells having a neural phenotype are selected from the group consisting of mesencephalic cells and striatal cells.

Claims 62-69 (Canceled)

70. (Previously presented) A method of producing neural cells, said method comprising exposing pluripotent stem or progenitor cells obtained from umbilical cord blood to an amount of a differentiation agent that is effective for changing the phenotype of said stem or progenitor cells to a neural phenotype.

71. (Currently amended) The method of claim 70, wherein said differentiation agent is selected from the group consisting of retinoic acid, fetal or mature mesencephalic or striatal cells, brain derived neurotrophic factor (BDNF), glial derived neurotrophic factor (GDNF), ~~glial~~

~~growth factor (GFF),~~ nerve growth factor (NGF), fibroblast growth factor (FGF), transforming growth factors (TGF), ciliary neurotrophic factor (CNTF), bone-morphogenetic proteins (BMP), leukemia inhibitory factor (LIF), glial growth factor (GGF),-tumor necrosis factors (TNF), interferon, insulin-like growth factors (IGF), colony stimulating factors (CSF), KIT receptor stem cell factor (KIT-SCF), interferon, triiodothyronine, thyroxine, erythropoietin, thrombopoietin, glial-cell missing silencer factor, neuron restrictive silencer factor, SRC-homology-2-domain-containing transforming protein, proteoglycans, glycoproteins, neural adhesion molecules, and mixtures thereof.

72. (Currently amended) An isolated neural cell obtained ~~obtainable~~ from umbilical cord blood, wherein said neural cell exhibits both an increase in expression of genes associated with neurogenesis and a decrease in expression of genes associated with hematopoiesis when said neural cell is in the presence of an effective amount of a differentiation agent in comparison to an umbilical cord blood cell that has not been cultured in the presence of the differentiation agent.

73. (Currently amended) The isolated neural cell of claim 72, wherein said gene ~~genes~~ associated with neurogenesis is ~~are selected from the group consisting of neurite outgrowth promoting protein, glypican 4,~~ β-tubulin folding cofactor D~~, pro galanin, FE65 stat like protein, glial acidic fibrillary protein, neuron derived orphan receptor, neuronal pentraxin II, neuronal growth protein 43, neuronal PAS 1, neuronal DHP sensitive, voltage dependent, calcium channel alpha 1D subunit, bone morphogenetic protein 1, retinal glutamate transporter EAAT5, TrkC, ENO2 gene for neuron specific (gamma) enolase, human brain protein recognized by the sera of patients with paraneoplastic sensory neuronopathy, bone morphogenetic protein 2A, neuronal PAS2, survival motor neuron pseudogene, glial growth factor 2, neural cell adhesion molecule Exon SEC, follistatin related protein, microtubule associated protein 2, vesicular acetylcholine transporter, neurofilament subunit M, neurofilament subunit NF L, musashil, bone morphogenetic protein 11, and tenascin C~~; and wherein said genes associated with hematopoiesis are selected from the group consisting of HLA class I locus C heavy chain, macrophage receptor MARCO, attractin, alpha-1 collagen

type II, leucocyte immunoglobulin-like receptor-8, thymocyte antigen CD1c, erythropoietin receptor, erythropoietin, monocyte chemotactic protein-2, LAG-3 mRNA for CD4-related protein involved in lymphocyte activation, interleukin-7 receptor, complement receptor type 1, T cell receptor, p50-NF-kappa B homolog, lymphocyte-specific protein tyrosine kinase, ~~LAG-3 mRNA for CD4-related protein involved in lymphocyte activation,~~ erythrocyte membrane protein Rh30A, erythrocyte membrane protein band 4.2, leukocyte IgG receptor, and erythroblast macrophage protein.

74. (Previously presented) The isolated neural cell of claim 72, wherein said neural cell is a human cell.

75. (Canceled)

76. (Currently amended) The isolated neural cell of claim 72, wherein said neural cell does not express CD34 antigen.

77. (Previously presented) The isolated neural cell of claim 72, wherein said neural cell is a multipotent neural progenitor cell.

78. (Previously presented) The isolated neural cell of claim 72, wherein said neural cell differentiates into neurons and glial cells *in vivo*.

79. (Previously presented) The isolated neural cell of claim 72, wherein said neural cell differentiates into neurons and glial cells in the presence of an effective amount of a differentiation agent.

80. (Previously presented) The isolated neural cell of claim 72, wherein said neural cell has been transduced with a polynucleotide that is expressed in said cell.

81. (Currently amended) An isolated human multipotent neural progenitor cell obtained ~~obtainable~~ from umbilical cord blood, wherein said neural progenitor cell exhibits both an increase in the expression of genes associated with neurogenesis and a decrease in the expression of genes associated with hematopoiesis when said neural progenitor cell is in the presence of an effective amount of a differentiation agent in comparison to an umbilical cord blood cell that has not been cultured in the presence of the differentiation agent.

Claims 82-84 (Canceled)